A Work Project, presented as part of the requirements for the Award of a Master's degree in Management from the Nova School of Business and Economics.

OMNICHANNEL:

A comparative analysis of the leading retailers in the United States and customer behavior

FEDERICA SMORTO

Work project carried out under the supervision of:

Prof. Manuel P. Baganha

12-01-2021

Abstract

The study aims to provide an overview of the phenomenon of omnichannel retailing in the United States and a comparative analysis of ten leading retailers. Findings revel that it is not necessarily true that retailers with a higher level of online sales need less inventory, thus a higher turnover. It also utilises primary data collected by an online survey to analyse the U.S. customer preferences about omnichannel services. Moreover, an analysis of variance suggests that there is no evidence that U.S. people who belong to different generations make, on average, a different number of online purchases per year.

Keywords: Omnichannel; Retailers; Inventory turnover; Online Sales; Consumer preferences

Acknowledgements

I would like to express my gratitude to my supervisor, Professor Manuel Baganha, for giving constructive guidance and feedback throughout the process of writing my Master thesis.

I would like to dedicate this work to my family who has always supported me in all my educational choices. Thank you for giving me the possibility to pursue all my goals and dreams.

I would like to thank my closer friends for always being by my side, even if miles away.

I am also particularly grateful to my international "milestoners" for this incredible journey full of study, group works and unforgettable experiences.

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

1. Introduction

Traditionally, an order could be placed either in the brick-and-mortar store, by mail or via telephone, after consulting a catalog. The rise of the phenomenon of omnichannel retailing in the United States dates back to 2003 when Best Buy, driven by the desire to aggressively compete with the giant Walmart in the sale of electronic products, chose to focus on customer-centricity and provide services both in store and online.

Nowadays, more and more retailers are integrating their brick-and-mortar and online channels, taking advantage of the convenience of Internet purchases to boost revenues. The use of omnichannel services offers to retailers the chance to reach expanded customers and improve the efficiency in their operations through economies of scale and the synergy effect between the channels (Xia and Zhang, 2010).

However, retailers' tasks became even more difficult than before since they have to manage multiple warehouses to serve both their online customers and brick-and-mortar stores. According to Gallino and Moreno (2019), the omnichannel transformation should take place without losing sight of four fundamental points: inventory management, forecasting, employee management, and product assortment. The increase in variety of channel formats has become more attractive for consumers, but, at the same time, trickier to manage for retailers (Ailawadi and Farris, 2017). For instance, companies are allowing customers to buy items online and pick-up the orders at the store, at a locker, or a counter, and then return them in the store again. Alternatively, retailers give the possibility to order a product in store and request for the delivery at home paying an additional fee for the shipping.

Consumers of all ages have become more demanding in their choices, valuing the purchase experience that favors convenience throughout the shopping process and easier interaction with the retailer; moreover, they show a lower tolerance to stock-out and delays in deliveries. As a

result, companies need to understand consumers' needs and design strategies that require new technological investments. I am going to analyse the phenomenon of omnichannel and the relative features in the following six chapters. The current chapter gives an overview of the topic and the research questions under study. The second chapter includes the literature review about omnichannel, both from an operational and marketing points of view. Then, the main structures that can be designed through a combination of brick-and-mortar and online channels will be provided. It will be ended by covering the key features of the retail market in the United States (to build a framework for the quantitative part presented below) and a summary of the companies considered for this study. Literature about omnichannel retailing in the United States is numerous. Notwithstanding, information concerning the sales via the only online channel are difficult to retrieve. The third chapter shows the methodology used to answer the following research questions:

- **RQ1:** "How do the presence of omnichannel would be impacting the profitability and inventory of the leading retailers in the United States?"
- **RQ2:** "Is the age of customers independent from the average number of items they buy online?"
- **RQ3:** "What are the preferences of U.S. consumers during the omnichannel shopping experience?"

The omnichannel transition already took place in several companies. For the first research question, I focused on the leading retailers in the United States because they are exploiting, more than the others, the benefits available to them through digital technologies. Instead, RQ2 and RQ3 have been developed to have a customer's point of view about omnichannel services.

The main findings of the study will be shown in the fourth chapter, followed by the conclusions in the next one. Finally, the limitations along with the future research lines will be presented in the sixth chapter.

2. Literature Review

2.1 Omnichannel as a concept

According to Verhoef et al. (2015), Omnichannel management is defined as "the synergic management of the numerous available channels and customer touchpoints, in such a way that the customer experience across channels and the performance over channels is optimized".

From a logistical point of view, a first description that has to be made regards the evolution of retail through four different stages: Single Channel, Multi-Channel, Cross-channel, and Omnichannel logistics approaches.

In the first approach, retailers use one distribution option and a logistics system to reach customers. For example, in the '90s Walmart sold only through physical stores, while Amazon sold through an online platform (Gallino and Moreno, 2019).

With a Multi-Channel approach, retailers operate different channels, but with separate units, designing independent systems for logistics (Hubner et al., 2015). In this case, the complexity is relatively low and there is no integration of inventory between channels. For instance, when Nordstrom first received the online orders, it fulfilled them by a separate warehouse.

Cross-channel is when the company operates in two or more channels integrating them at the back end (Gallino and Moreno, 2019). For example, if a client orders a product online, it is more convenient for the company to ship it from its brick-and-mortar store than from a distant

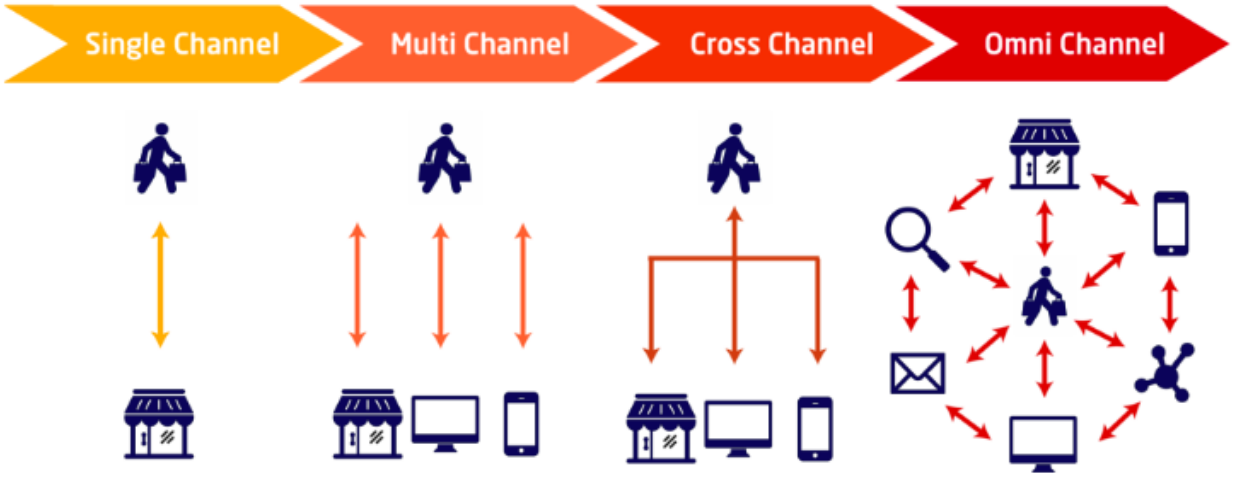
distribution center. However, even if the channels work together to offer more functionality, the customer perceives them separately.

The objective of an Omnichannel logistics strategy is to synchronize inventories, pricing, distribution, and logistics functions across channels, in order to better fulfill customers' demand in the digital era. For example, a buyer has the possibility to check an apparel item online, then touch and try on it in the store and eventually buy it and request for home delivery. Moreover, if the shopper is not satisfied, he can exchange the item in another store that sells the same brand or mail it back to the site.

Another definition of Omnichannel retailing is given by Chopra (2018) who said that "it refers to the use of multiple channels to interact with customers and fulfill their orders". Retailer aims to raise consumers' satisfaction providing them a shopping experience that incorporates both online and offline channels. This strategy gives companies the opportunity to maximize their efficiency and take control of their cost structure. However, designing logistics has certainly become more challenging and complicated than before. This happens because companies have to make complex decisions about where an order should be picked up and shipped from (Joakim Kembro, 2018) while taking into consideration different variables including lead-time, handling, and transportation costs.

Focusing on a marketing perspective, "Omnichannel marketing puts customers at the center of all interactions and seeks to make it as simple as possible for a customer to make a purchase" (Ungvarsky, Janine, 2020). Companies that use a combination of physical and online channels are usually at the forefront and ahead of the competition because they mainly focus on the clients' needs. Indeed, their expectations are constantly rising due to the growth of digital channels that made the choice and purchase process easier. With the advent of omnichannel, clients are becoming more sophisticated and they no longer purchase exclusively in stores;

instead, they expect an outstanding shopping experience and consider all the different alternatives to place an order (for example, using an electronic device), pick-up, receive and return products. The final result is a shopper journey that can be initiated in one channel and finished in another.



(Source: The Omnichannel Supply Chain - *Nate Schwandt*)

2.1.1 Different combinations of channels

Omnichannel is driving many logistics challenges in the supply chain of companies (Forbes).

In the past, the brick-and-mortar method was the only one adopted by retailers with physical locations like an outlet or chain of stores. Brick-and-mortar (B&M) is defined by Tetteh & Xu (2014) as a channel "in which customer demand at the retail store is met with on-hand inventory from the bottom echelon". In other words, a customer who is interested in a Luis Vuitton branded bag can buy it in the specific LV retail shop. Based on the stock on hand, the retailer warehouse in the physical store conveys with the manufacturer for the provision of new products.

Differently, the online channel allows the customer to easily place an order through the Internet or a smart device. In this way, the client can benefit from this fast, convenient, and time-saving experience, and retailers benefit from less inventory storage.

Nowadays, many retailers are incorporating an online channel (to complement the traditional one) in order to create a more responsive and cost-effective supply chain (Chopra, 2016). A combination of different channels is usually more effective than a single one since it allows the combination of the complementary strengths of the two alternatives.

Due to the characteristics of the aforementioned channels, enterprises can opt for several strategies focusing on two operational factors: inventory and delivery time. In detail, online retailers, that give the option of home shipping, need to optimize the delivery time; while brick-and-mortar stores need to keep the optimal amount of inventory to avoid stock-out (Erick Li and Steven Lu, 2014).

Omnichannel solutions require high levels of coordination between stores and supply chain managers. Hybrid structures can be designed through a combination of Brick-and-Mortar and Online channels, namely Traditional Retail, Showrooms with home delivery, Online Information with home delivery, or pick-up from the customer (Chopra, 2018).

The main peculiarities of **traditional retail** are face-to-face interactions and information exchanges. This channel is the most suitable for low price products with predictable demand; moreover, it is favored by customers who would be willing to pay more to touch, see or try on a product. Since the customer goes directly to the store to make the purchase, every facility requires high levels of inventory. From the perspective of the company, picking up at the store is convenient because it avoids last-mile delivery, thus eliminating additional transportation costs. At the same time, the client who goes to the shop is more likely to find and buy something else, which results in a consequent increase in the company's revenues.

A **showroom** allows customers to have a face-to-face interaction and it is the ideal channel for high-value products like expensive fashion goods. Moreover, the showroom can lower inventory levels resulting in cost savings for two main reasons. The first one is that the variety can be postponed until the order is received; the second reason is that the product will be ordered at lower-cost facilities and delivered to the customer. However, this certainly leads to higher transportation costs.

The **online channel** is the most suitable for products characterized by low levels of complexity and unpredictable demand. It allows the aggregation of inventories in a few locations with consequent cost savings. Chopra (2018) underlines that "the relative benefit of aggregation is small for high-demand items with low variability but large for low-demand items with high variability". One of the main advantages of this channel is providing a wide range of products while keeping storage costs relatively low. However, offering **home delivery** significantly increases transportation costs. For this reason, some retailers offer customers the possibility to place the order online and **pick-up the products in the designated location** to avoid high transportation costs. For example, Amazon had the idea of adding pick-up locations in some university campus to send students' orders in one unique place and lower delivery costs. In general, many retailers adapted to new ways of selling, and adopted the "click and collect" service which consists of buying online and collecting the order at the nearest store. Overall, every company should take into consideration the clients it wants to target before making any choice about its omnichannel portfolio.

2.2 Retail Market in the United States

Retail is related to the sale of goods and/or services to ultimate consumers through various channels of distribution. The main responsibility of the retailer is to match the demand of the consumers with the supplies of the manufacturers. Retail is a broad concept that incorporates a wide range of categories (including Fashion, Electronics & Media, Toys, Hobby & DIY, Furniture & Appliances, Food & Personal Care) and the transactions can occur through both in store and non-store retail channels.

The United States is the largest retail market in the world. In 2019, the total U.S. sales amounted to approximately 5.47 trillion U.S. dollars, showing a growth rate of about 2.8% compared to those of the previous year. Moreover, retail sales in the U.S. are projected to reach 5.94 trillion U.S. dollars in 2024 (Statista, 2020).

In 2019, brick-and-mortar retail is still the dominant channel in the United States as it generated about 4924 billion U.S. dollars. However, the number of physical stores decreased during the last period, from 450940 in 2017 to 442597 in 2019 (Statista, 2020).

The U.S. is a lucrative market characterized by the presence of many companies. In 2019, the leading 5 retailers in the United States by net sales are Walmart, Amazon.com, The Kroger Co., Costco, and Walgreens Boots Alliance. Even if these companies operate all over the world, the larger portion of their revenues come from American sales. A different ranking can be built based on the e-commerce net sales, where Amazon.com, Walmart.com, and Apple.com take the lead with US$ 62560, US$ 14667, and US$ 9944 million, respectively (Statista, 2020).

The world of retailing is constantly evolving and adapting to the new expectations of consumers in a highly competitive environment. Indeed, companies have to face not only aggressive and fast-moving competitors but also digital disruptors like Amazon. Business-to-consumers (B2C)

electronic transactions, (commonly referred to as online shopping) are gaining a lot of share in the U.S., especially following the impact of the Covid-19 pandemic that required the temporary closure of many stores in the U.S. and worldwide.

2.2.1 Omnichannel Retail in the United States

Retailing is a dynamic industry, and many companies operate omnichannel strategies that can significantly differ from each other. For instance, the leading retailer Walmart proposes various options to the clients such as “same-day pick-up”, “same-day delivery” or “delivery unlimited”. Differently, the largest online retailer Amazon opened in 2016 the first Amazon Go store, a convenience store chain subsidiary where shoppers can check into the store with a mobile phone code and the scanner automatically charge their credit or debit card upon leaving the store with their chosen items. Moreover, Amazon recently got a significant grocery market share with the acquisition of the grocery store chain WholeFoods, even if it is still far from the grocery giants.

Most of the retailers in the United States have both a physical store and online existence, regardless of their size. Even if brick-and-mortar is still the main retail sales channel, eCommerce has become a mainstream part of consumers’ lives, especially for the youngest generations who shop through a desktop, smartphone, tablet or other mobile. Ecommerce in the U.S. is a highly concentrated and mature market with well-established players, and the fashion segment is certainly the key beneficiary of this “boom” (MarketLine).

Retailers need a relevant internet presence to accommodate a digital transformation to not become obsolete and exit the market. They are adopting an omnichannel approach to retail that includes services such as home delivery, “buy online, pick-up in store”, “buy online, return-in store”, “endless aisle” and many others.

The option "**Buy online, pick-up in store**" (also known as Click and collect) is considered as an indicator of the company's omnichannel capabilities. According to Statista (2020), in 2019, a share of 27,5% of retailers in the United States took advantage of this service. The BOPIS retail sales are forecast to amount to US$ 74,24 billion by 2022. This service offers different alternatives to the customers, such as pick-up the products at the counter, curbside pick-up, delivery to the trunk of a car or pick-up the products at a locker (Statista, 2020).

A similar service is "**Buy online, return in store**" which allows U.S. customers to return the items in a physical store, regardless of whether the purchase was made online or not. From a company's point of view, the advantage of the BORIS service is that the clients who return the product in store could be attracted by other items and buy more than they did before.

"**Endless aisle**" is another common omnichannel service that enables consumers to virtually order products that are out of stock or not sold in store and have them shipped to the store or directly to their home.

Retailers need an agile and adaptable supply chain to keep up with the demand and maintain the efficiency of the production. They need to invest time and resources so that the different channels look interchangeable in the eyes of shoppers. Therefore, consumers are at the center of the omnichannel strategy and they are constantly looking forward to new innovative solutions that can solve an issue and make their lives easier.

2.3 A brief overview of some of the leading retailers in the U.S.

Walmart is the largest retail corporation of discount department and warehouse stores in the world**.** The company was founded in 1962 and it is actually headquartered in Bentonville, Arkansas. Walmart was ranked the first largest company according to sales, and its competitive

advantages consist of the low prices and large selection of items. It started its omnichannel strategies for competitiveness reasons against initial pure-online retailers like Amazon. Walmart's leading position, due to its large brick-and-mortar retail business, has facilitated the mission of bringing customers the best of both digital and physical commerce.

Amazon.com is the leading e-retailer in the United States, and it is based in Seattle. The company started as an online marketplace for books in 1994 and, over the years, it offered online retail, consumer electronics and digital content (Statista). Its main advantage resides in the delivery services and the vast selection of products with competitive prices. As mentioned before, it only entered the world of groceries in 2016 with the opening of the first Amazon Go store.

Costco is a corporation that sells different wholesale products, it was founded in 1983 and it is currently headquartered in Issaquah, Washington. It operates in different departments such as grocery, apparel, books and electronics. Costco requires its customers to have an annual membership to make purchases in their stores and it provides a wide selection of merchandise at low prices. Costo.com is ranked 9th in the list of the top online stores by net sales (2019) in the United States.

The Home Depot is a large home improvement retailer that offers clients building materials, home improvement products, décor products and installation services. It is based in Georgia and it has over 90 distribution centers across the United States. In 2019, homedepot.com has been the 4th most used online store, and especially the "buy online, pick-up in store" strategy results in the most attractive for its digital customers.

CVS Health Corporation is an integrated pharmacy health care provider. It operates through different segments such as pharmacy services, retail or long-term care. The original company was founded in 1963 and it is currently headquartered in Woonsocket, RI. CVS Health Corporation

proposes a new approach to total health that consists of making qualitative care cheaper, accessible, and seamless.

Target is one of the largest discount retailers in the United States, together with the main competitors Walmart and Costco. The history of Target dates back to 1902, however, the first Target store was opened in 1962 in Minnesota. The company aims to keep up with the customer demands for speed and convenience. It sells a wide range of products such as food, apparel and household essentials through both offline and online channels. Indeed, target.com has been the 6th most used online store in 2019.

Lowe's Companies is a retail company specializing in home improvement that mainly provides products for repair, maintenance, decorating and remodelling. The company, founded in 1946, is headquartered in Mooresville, NC. Lowe's Companies focus on making the stores very attractive to customers, but the online channel is also highly developed.

Apple is considered one of the most valuable brands and one of the biggest technology companies in the entire world. It was founded by the former CEO Steve Jobs in 1976 and the headquarter is located in Cupertino, California. The company is recognized for designing, selling, and developing consumer electronics, software and online services. Net sales for apple.com increased so much during the years that it ranked third in the list of top online stores in 2019.

Best Buy is a large consumer electronics retailer headquartered in Richfield (Minnesota). It offers products and services to the customers through its stores, online website and call centers. The company generates most of its revenues through the sales of mobile phones and computing equipment. In 2019, bestbuy.com was ranked no. 5 in the top online stores ranking in the U.S.

Finally, **Kohl's** is a department store retail chain headquartered in Menomonee Falls, WI. Kohl's stores and website sell national and private brand products such as apparel, accessories, beauty,

footwear and home product at a moderate price. Kohl's operates through nine distribution centers and it is in the top ten of the top online stores in the United States in 2019 (Statista).

3. Methodology

In order to answer the first research question mentioned above, I used secondary data collected by the *National Retail Federation*'s annual lists of the *Top 100 Retailers*. In detail, this ranking shows the industry's largest companies according to the net U.S. sales. From the 100 listed, I selected 10 of the leading retailers and 4-years data about the U.S. total net sales, the number of U.S. stores, and the retail rank. Moreover, I gathered data from Statista about the U.S. online sales, from 2017 to 2019, of the 10 selected retailers to evaluate the effectiveness of omnichannel retail (Statista, 2020).

The number of stores is considered an indicator of efficiency, while the number of annual sales can be classified as an indicator of profitability (Journal of Retailing and Consumer Services, 2019). To determine the success of the omnichannel transition, I built one time series overlay plot for each U.S. retailer in order to show the evolution of the number of stores and total sales from 2016 to 2019. The information about the sales per channel will be relevant to evaluate if a decrease in the number of stores, which is accompanied by an increase in total sales, is the result of a strong boost of the online sales. For this purpose, I looked at information about the percentage of sales from the online channel (out of the total) in order to get the impact of omnichannel.

Furthermore, I gathered 3-years data from *Thomson Reuters* about the inventory turnover of the U.S. retailers previously selected. *Inventory turnover* is "a ratio showing how many times a company has sold and replaced inventory during a given period (usually a year)" and it is

calculated by the ratio of the Cost of Goods Sold and the average inventory (Investopedia). An ideal inventory turnover is usually between 4 and 6; however, the ratio differs for the various types of retail businesses. It is generally believed that, with a higher number of online sales, a company sells the inventory quickly; therefore, the inventory turnover would increase because the retailers need less inventory storage, on average, when they don't focus only on brick-and-mortar stores. Using Excel, I computed the coefficient of correlation ρ in three years (can be inferred with r) that measures the degree of linear association between the percentage of online sales (out of the total sales) and inventory turnover. Afterwards, I tested the hypothesis that is different from 0 using the t statistic. I took into consideration this specific KPI of omnichannel retail to have a holistic view of the operations and see if the companies that successfully integrated omnichannel have an impact on inventory and profitability.

The second part of the analysis aims to provide a deeper comprehension of the customers' purchasing behavior in response to the wide range of omnichannel services.

Using *Qualtrics,* I built a Survey that contains 13 different questions ranging from multiple choice to "rank order" questions. The questionnaire was addressed to U.S. citizens and people that live in the United States in order to understand how customers prefer to order and retrieve products. The survey was mainly shared through social media (Facebook and Instagram) and the collection resulted in 94 respondents. After cleaning data to exclude obvious outliers due to typos, I based my statistical research on 91 responses.

Subsequently, using Excel, I performed an *Analysis of Variance*, a technique that helps me to test if two or more mean values are different or equal. Additionally, it is a way of checking if a metric variable is related to a categorical variable. In this case, the metric variable is "Number of online purchases per year", while the categorical variable is "Age". In other words, ANOVA is useful to

assess if the average number of online purchases during a year is dependent on the age of the customers living in the United States.

For this purpose, I merged the respondents into four different classes according to their age:

- Boomers (55 – 74 years old)
- Generation X (39 – 54 years old)
- Millennials (24 – 38 years old)
- Generation Z (under 23 years old)

Before performing the analysis, I made two assumptions:

- Assumption 1: The variable "Number of online purchases per year" follows a *Normal distribution.*
- Assumption 2: The variances of this variable for all the groups are the same (*Homogeneity*).

I want to figure out how much of the total variation of the average number of online purchases per year comes from the variation **within** each of the four Age groups and how much comes from the variation **between** the four Age groups.

I came up with the F-statistic, a ratio of the mean square AGE (Sum of Squares between the samples divided by the degree of freedom between df=3) and mean square Error (the Sum of Square within divided by the degrees of freedom of the SSwithin df=87). Finally, I got the p-value that is the probability of getting the observed result of the test (F ratio) or something even greater if the null hypothesis is actually true.

4. Results

4.1 A comparative analysis of the leading retailers in the United States

The following table exhibits the sales and the number of stores in the United States of the ten aforementioned retailers from 2016 to 2019.

Retailers	U.S. Sales (billion US$)				Number of U.S. stores			
	2016	2017	2018	2019	2016	2017	2018	2019
Walmart	362,815	374,8	387,66	399,8	5284	5328	5263	5355
Amazon.com	77,024	102,96	120,93	193,64	3	456	490	564
Costco	85,778	93,08	101,43	111,75	497	510	523	542
The Home Depot	85,086	91,91	97,27	102,17	1965	1968	1969	1973
CVS Health Corporation	81,482	79,54	83,79	88,51	9769	9778	9954	9909
Target	69,495	71,88	74,48	77,13	1802	1822	1844	1868
Lowe's Companies	60,409	63,13	64,09	65,51	1831	1839	1723	1727
Apple Store/ iTunes	35,899	38,6	47,27	53,99	270	272	271	271
Best Buy	34,605	38,59	39,19	40,04	1360	1293	1024	995
Kohl's	18,752	18,9	19,17	18,92	1169	1174	1175	1171

Figure 1 (Appendix) shows a time series overlay plot for each of the 10 selected retailers in the United States. In detail, the graphs give information about changes in the number of U.S. stores (the blue line) and the trend of U.S. retail sales (the red line) in the four years.

According to the graph, Best Buy had success in decreasing the number of U.S. stores while remarkably increasing the sales. Looking at Table 2 (Appendix) I can infer this is due to the increase in sales via the online channel that represents about 15,53% and 17,44% of the total net sales in 2017 and 2019, respectively. The graph for CVS Health Corporation depicts a steady but continuous growth in U.S. sales and a fall in the number of stores (from 9954 to 9909) only between 2018 and 2019. In the same period, online sales increased by 0,11 percentage points.

The American multinational technology company Apple also presents a huge increase in net sales, from $US35,899 billion in 2016 to $US53,99 billion in 2019, while keeping roughly the

same number of stores. Moreover, the percentage of online sales remained relatively steady at about 20% of the total U.S. net sales.

Differently, retailers such as Costco, The Home Depot, Target and Kohl's show a strong brick-and-mortar drive since the number of physical stores and U.S. net sales follow the same path. Moreover, they all show a growth in the percentage of online sales out of the total, which still demonstrates a continuous transaction toward omnichannel.

Other considerations must be made when analysing Amazon's performance. The most popular online retailer opened the first physical store only in 2016 and, from that moment on, the number of physical stores increased and peaked at 564 stores (including supermarket chain Whole Foods) in 2019. From, $US77,024 billion in 2016, U.S. net sales for Amazon have more than doubled to reach $US193,64 billion in 2019. In the same year, Amazon generated $US68,9 billion via online sales (representing approximately 35,54% of the total sales).

Net sales for Walmart have consistently increased from 2016 to 2019. Despite the continuous and rapid growth of online sales, the B&M store is still dominating the distribution landscape for the American giant, probably for the experience that this traditional format offers to consumers.

Finally, Lowe's Companies move slowly to opening and closing stores each year, while the net sales showed a sharp increase from $US60,4 billion in 2016 to $US65,51 billion in 2019. Moreover, the percentage of online sales has risen by approximately 1,74 percentage points.

Table 1 (Appendix) shows the inventory turnover and the online U.S. net sales of the 10 retailers between 2017 and 2019. Best Buy, Costco, and Khol's inventory turnover trends continue to be relatively stable with very little volatility. For the leading online retailers (Amazon, Walmart and Apple), the inventory turnover ratio sequentially increased. In particular, Amazon is efficiently moving inventory during the year showing an inventory turnover of 8,1 times in 2017 and 8,8

times in 2019. Other retailers such as The Home Depot, CVS, Target, and Lowe's show a slight decrease (between 2017 and 2019) in the number of times the inventory turns per year.

The increase in inventory turnover could indicate that retailers that successfully increased online sales are able to sell the inventory quickly and re-stock promptly. Indeed, retailers with a well-functioning online channel have more consolidation and can in a way aggregate the inventory. Conversely, when retailers mainly focus on brick-and-mortar sales, they need to have more products in store and, consequently, more safety inventory.

I computed the coefficient of correlation (for three years) between the inventory turnover and the % of sales via the online channel and I tested the following hypothesis:

H0: $\rho = 0$ (The two variables are not connected)

H1: $\rho > 0$ (There is a positive correlation between the variables)

I calculated the value of the t statistic using the formula $t^* = \frac{r \times \sqrt{n-2}}{\sqrt{1-r^2}}$, where n=10.

In 2017 t*= 0.342; in 2018 t*= 0.350; in 2019 t*= 0.411.

Considering a 95% confidence level, the critical value of a t statistic with 8 degrees of freedom is 1.8595. Since t*<t, I have no evidence to reject the null hypothesis and I can infer the p-value is higher than any common level of significance. This means that there is not a significant connection between the variables. In other words, it is not necessarily true that retailers with a higher percentage of online sales need less inventory, thus a higher turnover.

4.2 A customers' point of view about Omnichannel services

I computed the **ANOVA** to assess if the mean number of online purchases per year is equal for people belonging to four different generations.

Using the sample of 91 respondents of the online survey I can observe that, on average, a person living in the United States buys 41 items per year through the online channel, with a standard deviation of s=39,53.

As shown in the table on the right, I calculated the estimation of the mean number of online purchases for the total sample and each generation class.

n=	Groups	The estimates of the mean number of online purchases
91		41,24
19	<23	26,26
34	24-38	42,82
9	39 - 54	51,67
29	>55	45,97

Then, I computed a 1-Factor ANOVA, testing the following hypothesis:

H0: The 4 means for the number of online purchases per year of the different generations are equal.

with the alternative hypothesis:

H1: There are, at least, 2 different means for the number of online purchases per year.

Looking at the data in the *box plot* (Figure 3, Appendix) I can conclude that, most likely, there are no reasons to reject the null hypothesis.

The total variation of the sample (Total Sum of square) is 140628,7, which includes the Sum of Square between the groups SSAGE=5973,1 (the variation that is in the data for the responsibility of the AGE) and the Sum of Square within the group SSError=134655,6 (what I can't explain).

	Sum of Squares	Degrees of freedom	Mean Sum of Squares	F	p-value
AGE	5973,090414	3	1991,030138	1,274	0,28829
ERROR	134655,5909	87	1547,765413		
TOTAL	140628,6813	90	1562,540904		

Looking at the ratio F= $\frac{\frac{SS\ AGE}{df\ AGE}}{\frac{SS\ Error}{df\ Error}} = \frac{MS\ AGE}{MS\ ERROR}$ = 1,274 I can infer that the variability between groups is small compared to the variability within groups. In other words, the variation between data is due mostly to differences within Age groups, therefore I expect the null hypothesis to be true. With this sample n=91 and a **0.05 level of significance**, I have no evidence to reject the null hypothesis since the F-value does not belong to the critical region ($F=1,274<F_{3,87}$). This means that I have no evidence that U.S. people who belong to different generations make, on average, a different number of online purchases per year. The p-value is 0,28829 and it is higher than any common level of significance (in this case, α=0,05) which is consistent with the result obtained above, and, therefore, I do not reject the null hypothesis.

The increase in store closures, combined with the boom of online sales, sparked a deep interest in how customer behavior is evolving. The opinion of customers belonging to different generations should give a better understanding of the development of omnichannel services.

From the 91 respondents to the survey, 50 are female (median age= 45 and standard deviation= 19) and 41 are male (median age= 35 and standard deviation= 17).

Figure 4 (Appendix) gives information about the customers' favorite shopping channels in the United States. In particular, around 86% of the customers declared they use multiple channels, while approximately 9% and 5% of the respondents use to buy only in store and only online, respectively. This indicates that the trend of consumer behavior tends to go digital. Concerning the preferences on how to retrieve products purchased online, approximately 92% of the respondents choose to receive the order at home, and only 8% decide to pick-up the order at the store. Moreover, no one has shown interest in the possibility of picking up the order at a counter or a locker (Figure 5, Appendix). Even if the percentage of people who favor home delivery is the

highest, most of the respondents say that delivery costs affect their shopping experience, showing a propensity to look for the alternative with free shipping.

Furthermore, when I look at the answers on how the respondents prefer to return items purchased online, I notice an almost equal split between those who choose to mail the products back to the site and those who return them to a physical store that sells the same brand (Figure 6, Appendix). Besides, a person declared he usually uses UPS or returns things purchased on Amazon at Whole Foods drop-off.

According to the findings, the major share of online shopping is made using a smartphone or a laptop, while 11% of surveyed people stated to have purchased items using a Tablet. Even if the processing of voice orders by Amazon Alexa or Siri is becoming popular, only 2% of the respondents stated they used this mechanism for purchasing online. This is probably due to the lack of usefulness when it comes to doing the initial product search. Similarly, Smart Tv is also a little-used device for shopping (Figure 7, Appendix).

Reasons to shop in the favorite brick-and-mortar store diverge among customers. The chart below (Figure 8, Appendix) illustrates that the main motivation is affordability, followed by the brand quality and the proximity to one's home. A good return policy, loyalty to the brand, and a socially responsible policy of the store take a back seat to previous motivations. A person also declares that a relationship with a salesperson is the main reason that leads her to buy in her favorite retailer.

Switching to the omnichannel services preferences, statistics in Figure 9 (Appendix) show that most of the respondents are interested to check online if an item is available in store (mean of 4,06 out of 5 with a standard deviation of 1,2). The results also show that the possibility to buy online and return in store and store with self-checkout using a smartphone arouse a lot of interest. More than half of the respondents rated the remaining options ("pick-up the products in store

outside the opening hours", "buy online, pick-up in store" and "buy in store, ship from warehouses") with medium interest (3 or lower).

Based on the analysis of the data in Table 2 (Appendix) people who live in the United States privilege the online channel for shopping mainly because it provides (in order of preference): more variety, easy price comparison, reviews of the items, and the ability to shop all day at all hours. Paradoxically, the possibility to avoid crowds and check-out lines is not one of the main reasons for buying items online, and it is followed by the user-friendly online experience and the presence of discount or loyalty reward.

With regard to the motivations to buy in store (Table 3, Appendix), about 48% of the respondents ranked the possibility to check the quality of the item in the first place. Ensuring the item is without defects, faster purchase experience, and helpful staff members are other main drivers for choosing to buy in a brick-and-mortar store. In contrast, convenience and in store experience stay at the bottom of the ranking since only 10% of the people put them as first choices.

From the tables in Table 4 (Appendix), I can infer the brick-and-mortar store is still an element of utmost importance both for research and purchase of Food and personal care items. Differently, for fashion items (that includes apparel, footwear, and accessories) 57% of the respondents declare they start checking the products online, but then 64% finish the purchase in the store. Following the same logic, more than half of the respondents look for furniture & appliances online while buying the items in the brick-and-mortar store. This shopping behavior is called "webrooming" and consists of searching the product on the Internet before going to the physical store for the final purchase. As mentioned before, the opposite behavior is defined as "showrooming" and it is when a person visits the store to check out a product but then the shopping experience ends with the online purchase.

To conclude, both Electronics & Media and Toys, Hobby and DIY are segments for which most of the respondents make an initial screening and evaluation of items online as well as the final purchase.

5. Conclusions

In light of what has been said so far, the mere in store or online presence is not as powerful as the integration of different channels in order to realize remarkable financial performance (Xia and Zhang). With the rise of the online channel, customers can instantly buy any type of product with a simple "click" and this service permits inventory to move at a much faster pace than in physical stores. With the steep rise in online sales, leading retailers like Amazon, Walmart, and Apple show a positive growth between 2017 and 219 in inventory turnover compared to the other companies. This could happen because, when selling online, retailers have one less node since products can be shipped directly from the warehouse. Consequently, each unit needs fewer days in inventory and there is an increase in the turnover ratio as well as efficiency. However, it is not necessarily true that retailers with a higher level of online sales show a higher inventory turnover because this depends on many other determinants. Omnichannel retailers have to focus on improving their inventory turnover and show more stock to online customers in order to increase sales. The data resulting from the online survey shows awareness of the use of multiple channels and it is clear how even older generations are adhering more and more to online purchases. Indeed, from the analysis of variance, I have no evidence that U.S. people who belong to different generations (Generation Z, Millennials, Generation X, and Boomers) make, on average, a different number of online purchases per year.

Finally, results show a tendency of customers from the U.S to place the order online and receive it at home; however, the brick-and-mortar store is still a pivotal channel when consumers need to

buy some product categories like food and personal care. Overall, the world is moving at rapid speed towards more omnichannel strategies, significantly altering the way orders and deliveries are done. Having a focus on omnichannel services is really important for retailers because the market is extremely competitive. Today's shoppers can easily switch from one retailer to another that meets their high expectations since they are genuinely open and fascinated by this world.

6. Discussion and Limitations

Several limitations in this study point to future lines of research. To begin, the small sample taken into consideration does not allow to reach too detailed conclusions about the test of hypothesis.

With regard to the analysis of the consumer behavior during the omnichannel shopping experience, most of the questions in the survey are general and it would be interesting to replicate the questionnaire focusing on a specific market like, for example, the Apparel market.

A further limitation concerns the fact that the information is limited to the United States. Future researches could analyse this specific topic in other countries in which consumers use different touchpoints during the shopping process. To conclude, the comparison of the retailers doesn't consider the impact of the Covid-19 pandemic on sales (as the time interval considered is from 2016 to 2019). In 2020, the Covid-19 crisis disrupted the traditional retail businesses and forced some companies to shut down their operations for months. Moreover, retailers are operating with new policies and adopting innovative systems because of the reduction in consumer demand and travel restrictions that put a lot of pressure and challenges on their supply chains. The current pandemic also accelerated the shift to online shopping, and companies are increasingly incorporating safer payment options, such as mobile payment. For these reasons, future studies could supplement the current research including the evolution in sales, the number of stores, and retailers' inventory turnover in 2020.

References

Gallino Santiago, Moreno Antonio. 2019. Operations in an Omnichannel World. Springer International Publishing.

Mirsch, T., Lehrer, C., & Jung, R. 2016. “Channel integration towards omnichannel management: a literature review”.

Ailawadi, K., & Farris, P. 2017. “Managing multi- and omnichannel distribution: Metrics and research directions”. Journal of Retailing, 93(1), 120–135.

Kembro, J. H., Norrman, A., & Eriksson, E. 2018. “Adapting warehouse operations and design to omni-channel logistics”. International Journal of Physical Distribution & Logistics Management.

Piotrowicz Wojciech, Cuthbertson Richard. 2019. Exploring Omnichannel Retailing. Springer International Publishing.

Hübner, A., Holzapfel, A., & Kuhn, H. 2015. “Operations management in multi-channel retailing: an exploratory study”. Operations Management Research, 8(3-4), 84-100.

Chopra, S. 2016. How omni-channel can be the future of retailing. Decision, 43(2), 135-144.

Li, Z., Lu, Q., & Talebian, M. 2015. “Online versus bricks-and-mortar retailing: a comparison of price, assortment and delivery time”. International Journal of Production Research, 53(13), 3823-3835.

Tetteh, A., & Xu, Q. 2014. “Supply chain distribution networks: single-, dual-, & omni-channel”. Interdisciplinary Journal of Research in Business, 3(9), 63-73.

Sean L. 2015. “Walmart: A Surprising Winner in Omnichannel Retail”. Digital Innovation and Transforming.

Ailawadi, K. L., & Farris, P. W. 2017. “Managing multi-and omni-channel distribution: metrics and research directions”. Journal of retailing, 93(1), 120-135.

Chopra, S. 2018. Supply Chain Management. Pearson Education Limited.

Kyle Krug. 2020. “Top 9 Omni-Channel Logistics Challenges Businesses Face”. Legacy supply Chain Services.

Chiang, W. Y. K., & Monahan, G. E. 2005. “Managing inventories in a two-echelon dual-channel supply chain”. European Journal of Operational Research, 162(2), 325-341.

Podreciks Alana, Uhlenbrock Nathan and Ungerman Kelly. 2018. “Who’s shipping where? The power of geospatial analytics in omnichannel retail”. McKinsey & Company.

Huang Jess, Kohli Sajal and Lal Shruti. 2019. “Winning in an era of unprecedented disruption: A perspective of US retail.

Monash University. 2012. “Challenges and opportunities of omni-channel retailing”.

Adivar, B., Hüseyinoğlu, I. Ö. Y., & Christopher, M. 2019. “A quantitative performance management framework for assessing omnichannel retail supply chains”. Journal of Retailing and Consumer Services, 48, 257-269.

2020. “Retail Market in the United States”. Statista.

Eden S., Hoyer A., Montasell G., Leve A. 2019. “eCommerce in the United States 2019”. ecommerceDB

Pohlman S. 2020. “eCommerce Report 2020”. Statista.

O’Connel Liam. 2019. “Omnichannel Retail in the United States”. Statista.

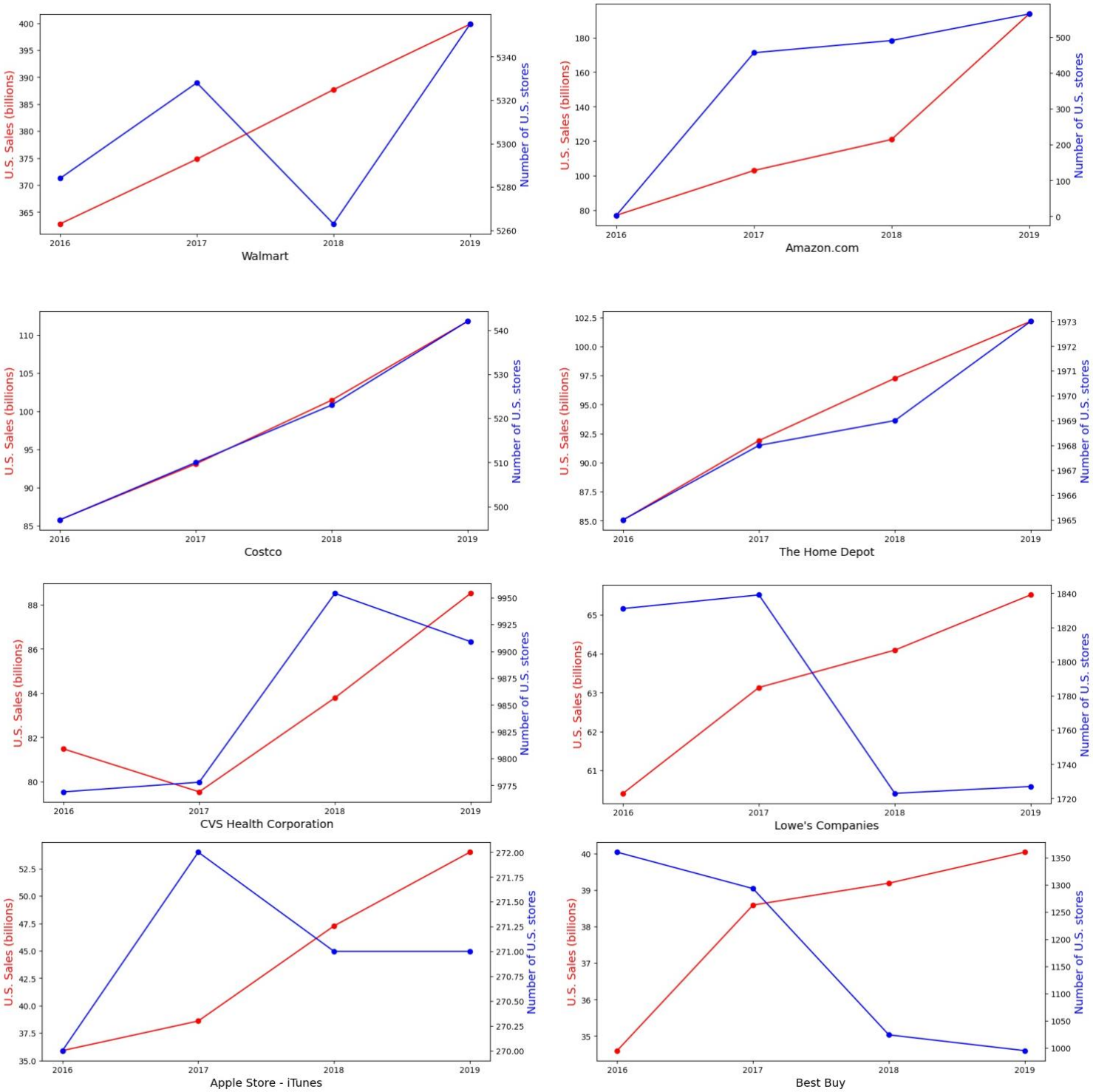
Flavián, C., Gurrea, R., & Orús, C. 2020. “Combining channels to make smart purchases: The role of webrooming and showrooming”. Journal of Retailing and Consumer Services, 52, 101923.

Xia, Y., & Zhang, G. P. 2010. “The impact of the online channel on retailers' performances: An empirical evaluation”. Decision Sciences, 41(3), 517-546.

Chopra, S. 2018. “The evolution of omni-channel retailing and its impact on supply chains”. Transportation research procedia, 30, 4-13.

Appendix

Figure 1



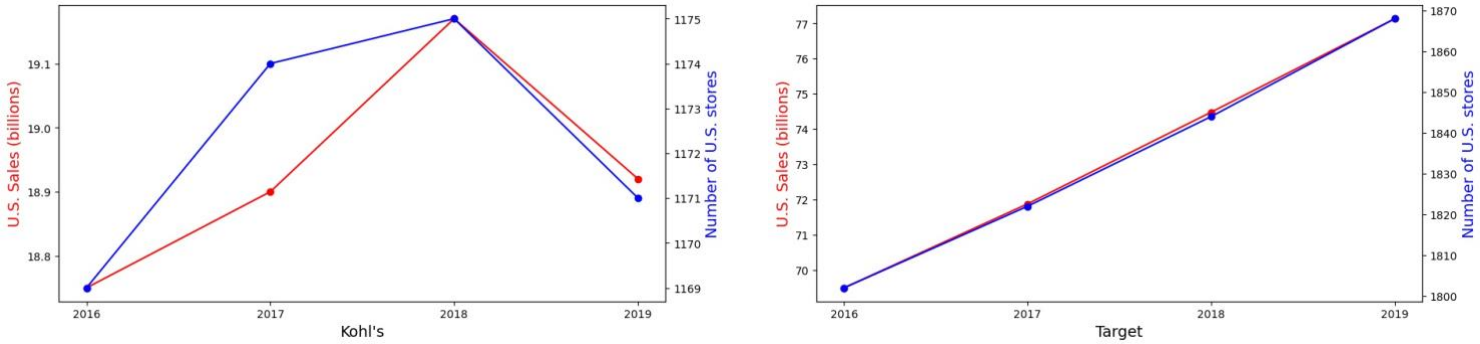


Figure 2

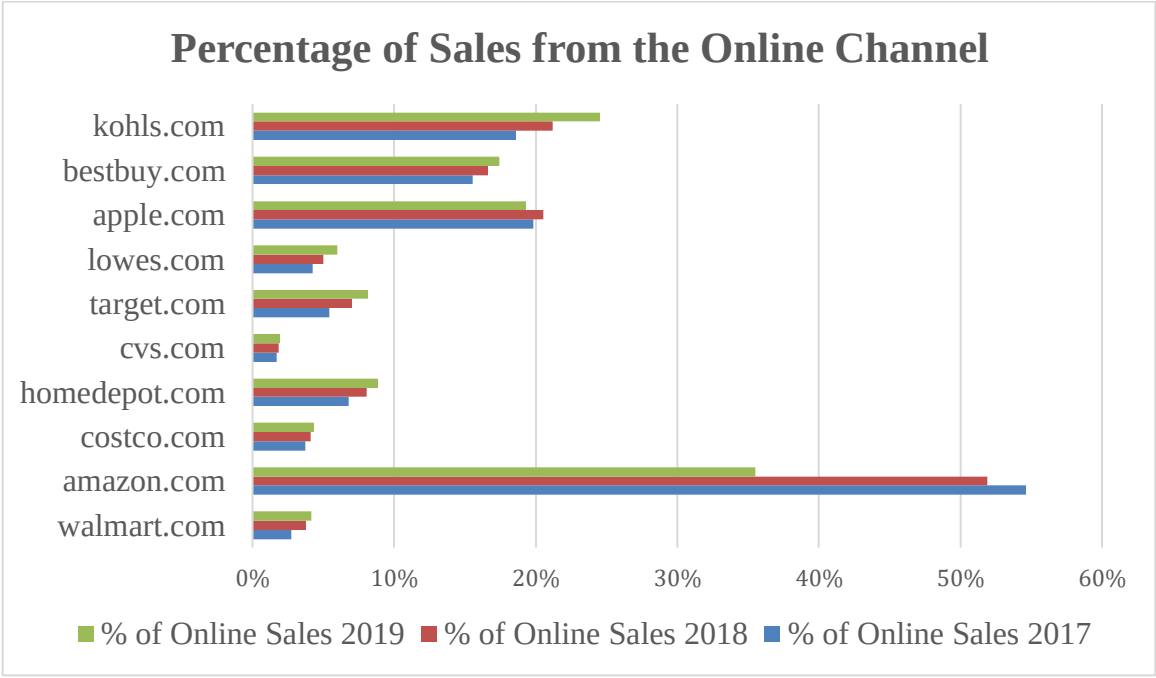


Table 1

Company	RIC	Inventory Turnover			Online U.S. Net Sales (billion US$)		
		2017	2018	2019	2017	2018	2019
Walmart	WMT.N	8,60	8,75	8,90	10,2739	14,6675	16,5527
Amazon.com	AMZN.OQ	8,14	8,38	8,79	56,2632	62,7798	68,8132
Costco	COST.OQ	11,80	11,85	12,26	3,4907	4,1735	4,8515
The Home Depot	HD.N	5,26	5,33	5,11	6,2617	7,8585	9,0535
CVS Health Corp.	CVS.N	10,21	9,86	9,35	1,36	1,542	1,72704
Target	TGT.N	6,05	5,89	5,93	3,913767	5,23185	6,30442
Lowe's Companies	LOW.N	4,23	4,04	3,82	2,668	3,2194	3,9113
Apple Store/ iTunes	AAPL.OQ	40,37	37,17	40,41	7,662456	9,70369	10,4221
Best Buy	BBY.N	6,41	6,20	6,35	5,9926	6,5245	6,9812
Kohl's	KSS.N	3,32	3,48	3,46	3,5214	4,0663	4,6456

Figure 3

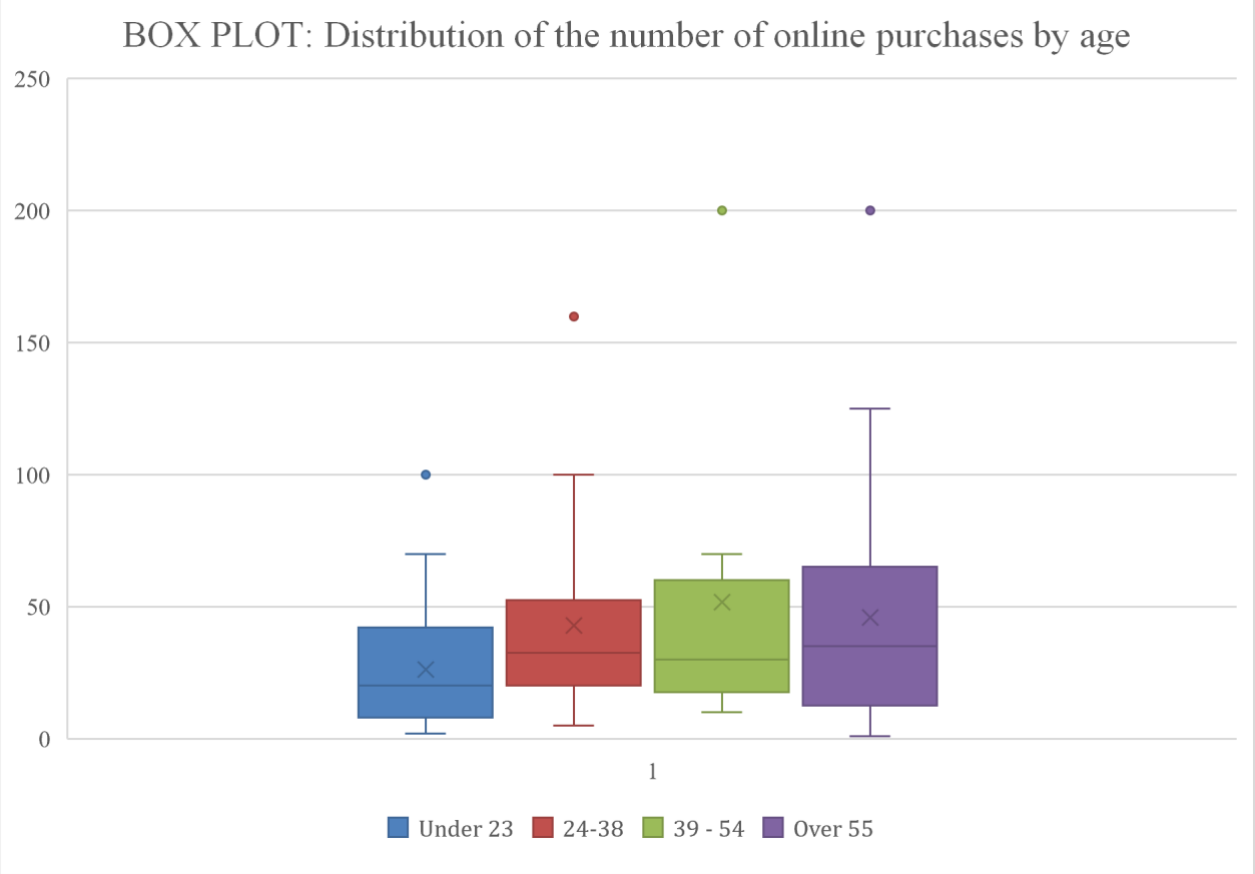


Figure 4: When buying products, which channel do you use?

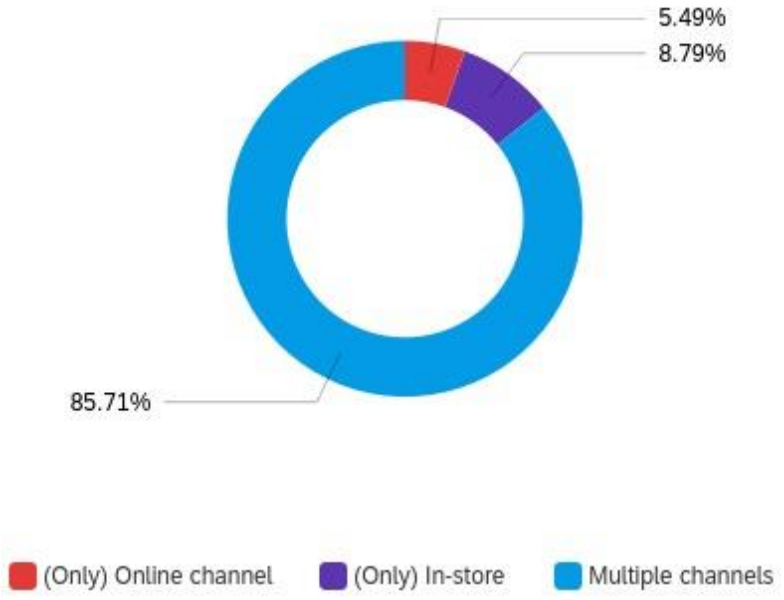


Figure 5: Consider a situation in which you are placing an order online, which of the following options would you prefer?

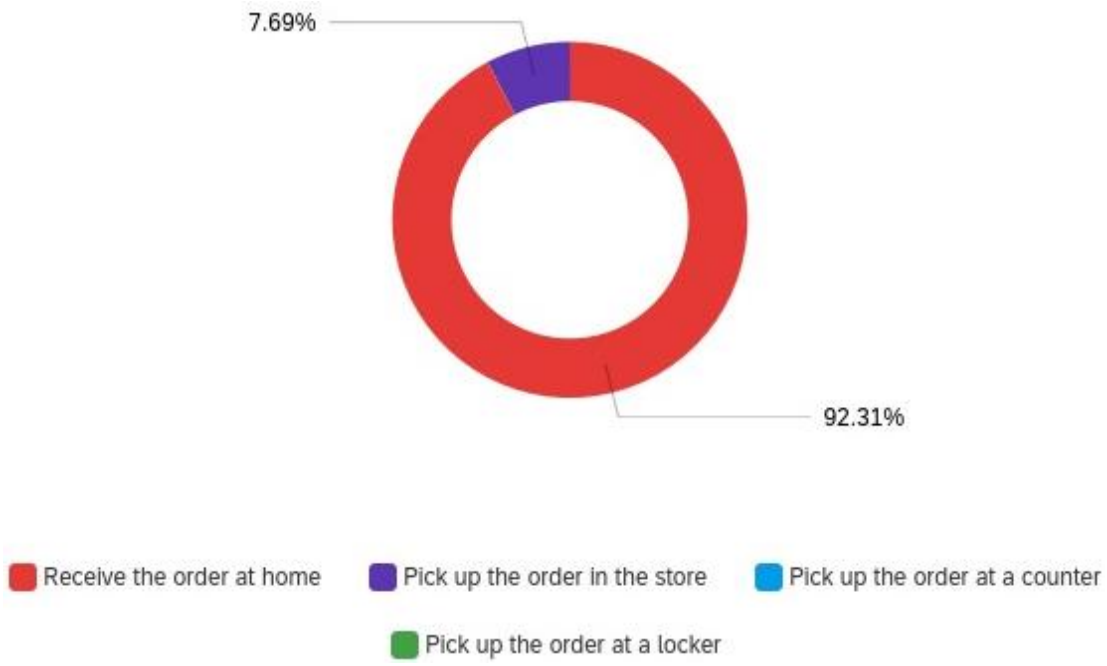


Figure 6: Where do you most frequently return items that you bought online?

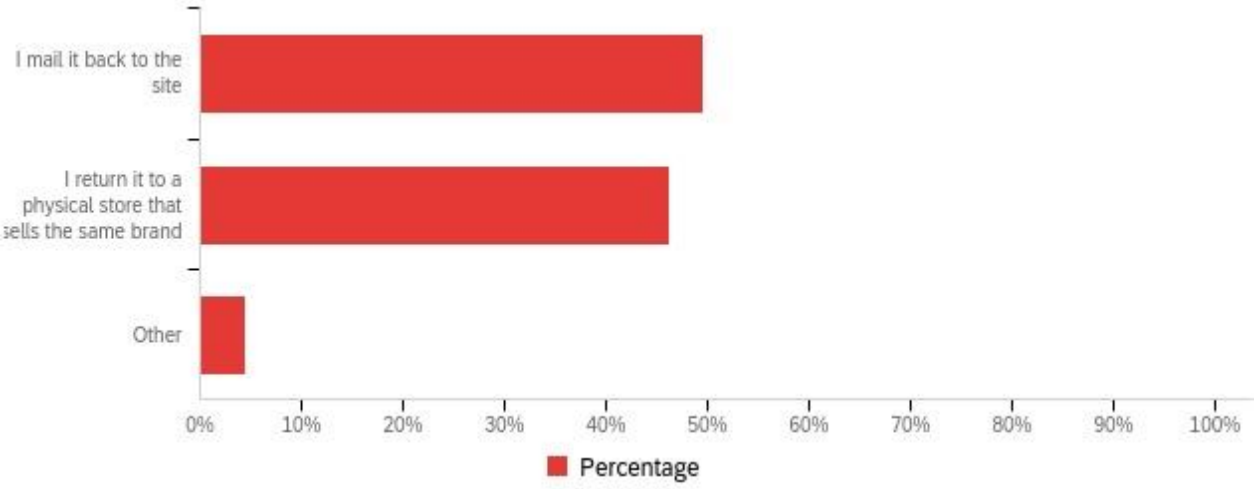


Figure 7: Which of the following devices do you usually use for shopping online? (You can select more than one)

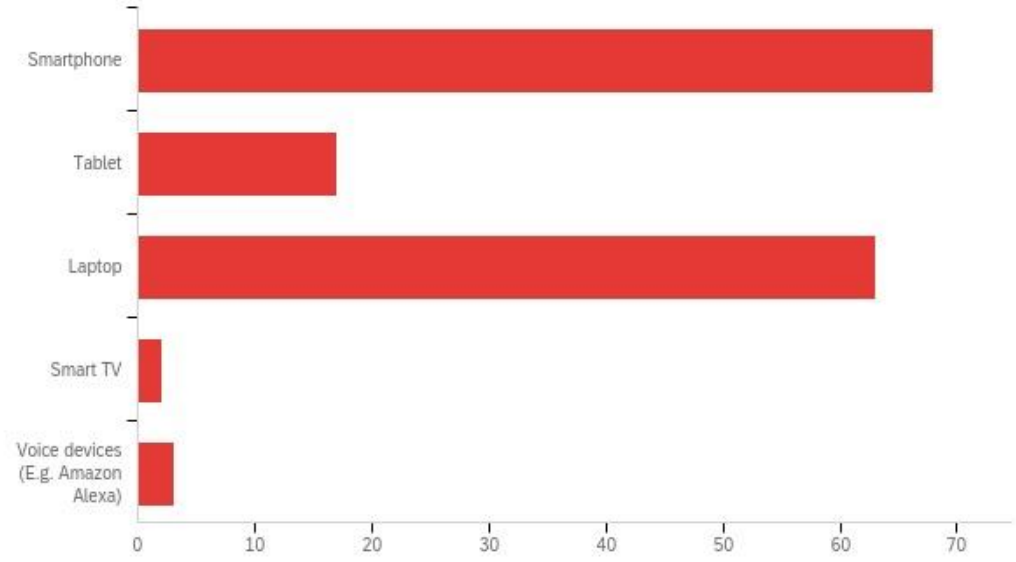


Figure 8: If you think about your favourite retailer, which are the reasons why you shop there? (max. 3)

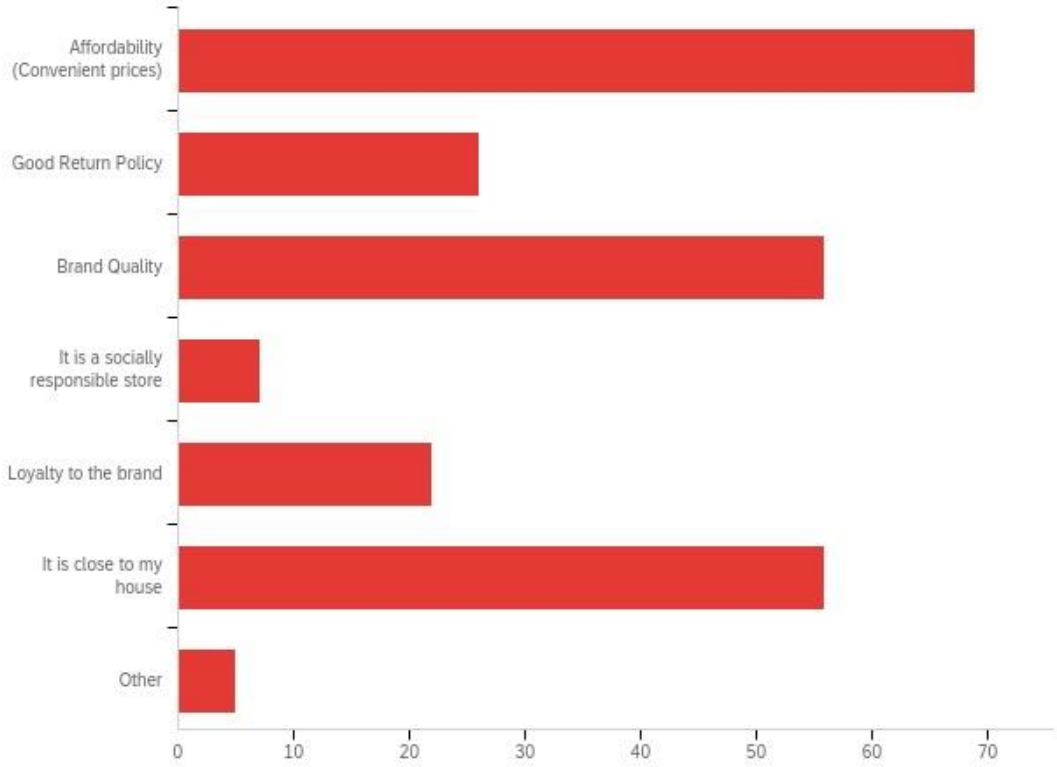


Figure 9: Please show your interest from 0 (not interested) to 5 (really interested) in the following omnichannel services:

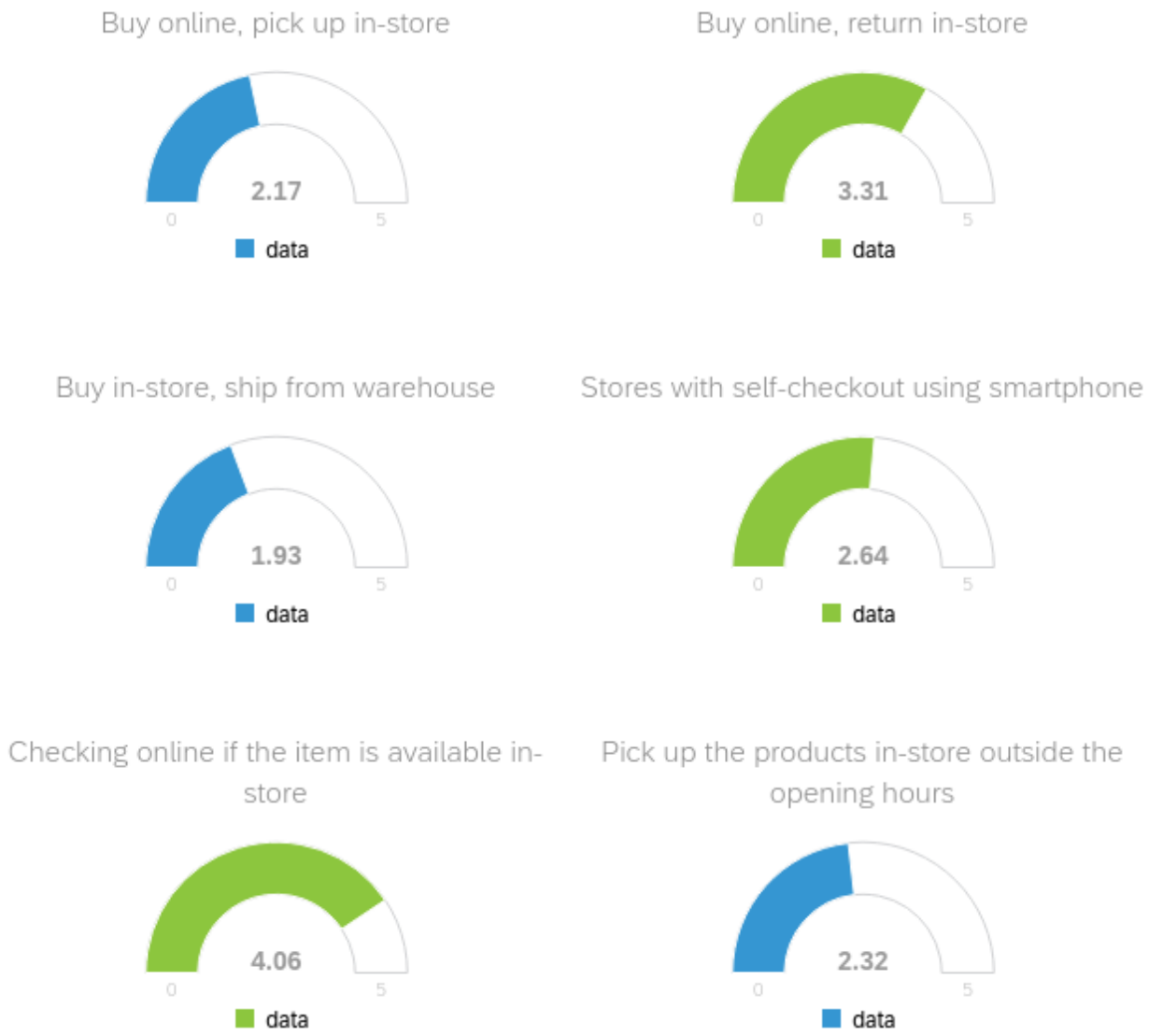


Table 2: Which are the main motivations for buying items online? Rank the following reasons (most preferred reason at the top):

#	Field	Mean Ranking position	Std Deviation
1	More variety	2.80	1.57
2	Easy price comparison	2.94	1.60
3	Search for reviews of the product	3.80	1.69
4	Ability to shop 24/7	3.97	1.99
5	To avoid crowds and check out lines	4.21	2.06
6	User friendly online experience	4.74	1.68
7	Discount or loyalty reward	5.54	1.89

Table 3: Which are the main motivations for buying items in store? Rank the following reasons (most preferred reason at the top):

#	Field	Mean Ranking position	Std Deviation
1	To check the quality of the item	1.91	1.13
2	To ensure it doesn't have any defects	3.36	1.48
3	Faster purchase experience	3.38	1.46
4	Helpful staff members	3.84	1.58
5	Convenience	4.11	1.62
6	In store experience	4.39	1.71

Table 4: Please select the channel you usually use to search for information and purchase items of the following segments:

Channel used to search for information		
Field	In store	Online
Fashion	42,7%	57,3%
Electonics and media	13,48%	86,52%
Toys, Hobby and DIY	21,84%	78,16%
Food and personal care	71,59%	28,41%
Furniture and applicances	40,23%	59,77%

Channel used to purchase items		
Field	In store	Online
Fashion	63,64%	36,36%
Electonics and media	44,32%	55,68%
Toys, Hobby and DIY	43,18%	56,82%
Food and personal care	94,32%	5,68%
Furniture and applicances	76,4%	23,6%